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PROPAGATION OF THE VINE.

HOW TO REGULATE VINEYARDS BY THE USE OF
SEEDLINGS. A TREATISE ILLUSTRATING THE
SUPERIORITY OF CONSTITUTIONALLY
PERFECT ROOTS.

ALSO

AN ESSAY ON THE PHYSICAL AND MORAL INFLUENCE
OF THE VINE.

BY

CHARLES A. WETMORE.



Second Edition, With Appendix.

SAN FRANCISCO.

Published by the SAN FRANCISCO MERCHANT, A. D. Bell, Proprietor, 323 Front Street.

1880.

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P R E F A C E.

TO THE VITICULTURISTS AND OTHER FARMERS OF CALIFORNIA.

This pamphlet is respectfully dedicated to the viticulturists and farmers of the State of California, to whom all who desire to witness the rapid advancement of industry and good society, and the creation of happy and comfortable homes for our people, earnestly appeal for continued intelligent exertions in ascertaining and demonstrating the practical possibilities of agriculture. The object of this work is not to create controversy, or to maintain a pet theory, but to stimulate experiment in the field of scientific agriculture and to induce the wanderer to settle down under his own vine and fig tree.

CHAS. A. WETMORE.

OAKLAND, CAL., March 1st, 1880.

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PROPAGATION OF THE VINE.

PRINCIPLES OF VITICULTURE RELATING TO DEVELOPMENT OF PERFECT ROOTS DISCUSSED.

THE WILD VINE OF CALIFORNIA—ITS VALUE FOR GRAFTING STOCK AND WINE MAKING.

A CHAPTER ON SILVANERS OR ZIERFAHNLS—EUROPEAN VINES OF SYLVAN
ORIGIN—PHYLLOXERA IN FRANCE.

REPRINTED FROM THE COLUMNS OF THE SAN FRANCISCO MERCHANT.

During the period of my observations and studies in France, in 1878, concerning the phylloxera plague, my attention was especially attracted to those remedies which had in view the restoration of exhausted soils and the regeneration of the constitutions of cultivated vines.

I found that the weight of evidence was in favor of the use of nitrogenous potash manures and of American vines, as near to the wild state as possible, for grafting stock. All specifics, to be used as simple insecticides, were found to be impracticable on account of great expense and their failures to provide radical and permanent cures.

The only permanent resistance was found where constitutional changes were wrought in vineyards.

Many French viticulturists and scientists adhered to and insisted upon the theory that the resistance of the American plants was solely due to the peculiar constitutional structure of their roots, being impervious to the attacks of the insect and that there could be no regeneration of European vines which would enable them to resist the plague. Some, however, with apparently good reasons, ascribed the rapid progress of the dis-

ease to the impaired constitutions of European vines, increased by over-production and the impoverishment of soils; these held the opinion that the American vines resisted because they were pure stocks, not worn out by excessive and vicious cultivation. These latter also thought that the European vine might be restored to a better degree of constitutional vigor through regeneration from the seed, which would cause the plague to disappear. It was necessary, therefore, to consider the phylloxera as an ordinary parasite developed into an epidemic by conditions favoring the spread of disease. Whether these were true, or not, the fact remained that the addition of potash to soils from which it had been exhausted retarded the progress of the insect in destroying vines, and that the substitution of certain American vines for the European varieties completely stayed the evil. The American vines experimented with were numerous in name, but it must be remembered that they have all been produced from a few original wild varieties, either improved by simple processes of reproduction, or hybridization. It was observed that the pure varieties were able to resist the insect (with some doubt concerning

the *labruscas*), and that the hybrids generally failed. The varieties considered sure were of the *cordifolia*, *riparia* and *aestivalis* types. No experiments had been made with the wild vines of California or Arizona (*vitis Californica* and *vitis Arizonica*).

I recommended then that our viticulturists should at once try the virtues of the wild vine of this State, which resembles somewhat the *riparia*. I called attention to a new proposition, viz: the use of seedling wild vines for grafting purposes in place of cuttings. This reform in grape culture, which if successful would cause each vine to have roots constitutionally perfect in all their parts with the undiminished vigor of an original plant, I thought to be based upon sound principles everywhere recognized in horticulture. It occurred to me that if cuttings were good to graft upon, seedlings, well selected, would be better, because their vitality would be unimpaired and their root system complete.

This idea has been criticised by many, upon first hearing it, because experience in raising seedlings had shown that in many cases they were inferior in strength to their parents. This however was answered at once by saying that the failures were probably almost wholly due to the fact that only the seeds of improved, or hybridized varieties had been experimented with. Such varieties not only generally fail to reproduce themselves through seedlings, but also fail to produce vigorous offspring. The experiment of reproducing simple, pure varieties, unaffected by crossed saps and high cultivation, had seldom if ever been tried, because the aim had been, in the past, when raising seedling grapes, to procure either new varieties by hybridization, or the reproduction of such as had already been hybridized. Seedlings had therefore generally shown constitutional weakness.

I feel quite safe in relying upon the general law of nature that propagation from the seed produces natural and healthful growth, and that each produces after its own kind, unless simple reproduction has suffered some violence rendering seeds unreliable.

There might however be some doubt as to the vigor or rapidity of the growth of a seedling wild vine, as compared with a cutting; but I found that in France seedlings produced wood as rapidly in most cases, and sometimes more rapidly than cuttings. I was hopeful also of the California vine, and determined to conduct some experiments. I shall now offer to our viticulturists all that I have been able to learn on the subject.

RESISTANCE TO THE PHYLLLOXERA.

I can find no reason to suppose that our indigenous vine will not resist phylloxera

equally as well as the vines of Missouri, Ohio, the Carolinas and Texas. I do find by examination of the Sonoma Valley that wild vines are flourishing in the midst of vineyards which have been destroyed by the pest. This proof is one that would be generally accepted as sufficient, but it is not by me for a reason which I will explain. I have ascertained that European varieties of vines in infected places are saved from the insect, if the soil near their roots is not disturbed by cultivation. Instances of this are the following: a roadway proves an obstacle to the advance of the plague and generally the vines next to the hard ground last longest; a vine in the rear of Mr. Attila Harazthy's residence in the Sonoma Valley, has survived, while the surrounding vineyard has been destroyed—the soil about it is tramped hard and compact and is not disturbed; old vineyards, abandoned, after being attacked severely by phylloxera, have become overgrown with weeds, the soil hardened, and resuscitation has been noted. It is probable that the insect cannot work in soils that are not thrown open to the air by cultivation, leaving crevices to follow and to enter and room for respiration. If this be true, the wild vine can only be fairly tested where the soil is cultivated and loosened. Sandy soils are preferable for vineyards; the phylloxera does not spread in them, probably because they do not, when loosened, leave passage-ways, such as clay soils do. However there is good reason to believe that our wild vine will resist the phylloxera; if so, I should prefer to use seedlings to graft upon. They may be produced in nurseries by the million, and at one year old an opportunity will be had for selecting only those of the most vigorous growth.

SELECTING SEEDS.

Last August I examined the wild vines which grow in the Souoma Valley with the intention of having seeds collected there. I was not satisfied with what I found, for two reasons; because the berries appeared imperfect, and I was afraid they might have been impregnated from the surrounding vineyards. I intended to follow carefully the theory that hybridizatim renders seedlings constitutionally weak, and also that seeds from the most prolific vines, bearing perfect bunches of grapes, would germinate, with the best results.

By inquiry I learned that the wild vines in the vicinity of Harbin's Springs, in Lake County, were the most luxuriant, prolific and bore the best developed bunches of fruit. At that time, I assumed, as others do, that there was only one variety of wild vine in the State—the *vitis Californica*, first described

by Bentham, and that all I needed was to procure seeds from the best specimens to be found. I am now convinced of an error, for I am quite sure that the varieties of our wild vines are quite numerous, though to the casual observer they all appear alike.

I succeeded in engaging Mr. C. Mattier, an intelligent Frenchman, who lives a hermit's life in the valley adjacent to Harbins Springs, to collect seeds for me. I found that he had already commenced to experiment with the wild vine as I had recommended.

On the 7th of April, 1879, he had scattered broadcast in his vegetable garden an oyster-can full of the seeds of the wild vine which he had saved. He had expected only a few to germinate; but thousands soon appeared above ground, most of which he destroyed in cultivating his garden. On the 2d of June he transplanted a few, as he would have done with tomato plants. These he took care of and watered. In the month of October, at my request, he dug up two of these seedlings, less than seven months old from the seed, and sent them to me, together with branches of an old wild vine of the same kind, which were loaded with fruit.

One of the seedlings, together with average samples of the wild fruit, I photographed to preserve for the use which I make of them now. They are figures 2 and 3 on the accompanying plate. The seedling had developed a perfect system of roots, the longest being three feet and a half to the point where broken off in the deep soil. The wood of the stem just above the scil was three-eighths of an inch in diameter and the growth three feet high. Subsequently I had a collection of the seedlings, which had not been cultivated and had had no advantage of water, sent to me. Most of them were too small to graft, though some were quite well developed. It is probable that if the seeds had been sown earlier and well cultivated in favorable ground, a large percentage would have produced vigorous plants. Nothing could have been more satisfactory than Mr. Mattier's experiment, as far as it shows the vigor of these seedlings. Figure 2 in the accompanying plate represents the seedling photographed a little less than one half the natural size.

Mr. Mattier says that he had used the wild grapes to mix with the Mission and other cultivated varieties to produce claret wines, and that he had discovered remarkable vinous qualities in them similar to those of the best Bordeaux grapes. He found certain bunches among the vines growing near Harbin's Springs, which had accidentally developed in size and character to such a degree of perfection that he had conceived the idea of improving them by cultivation, not for grafting

stock, but for producing fruit for wine making. One bunch he had found measured eight inches in length, the berries being large and well matured. But of this feature I shall write further on when noticing the value of this vine on its own merits, independently of its value for grafting stock.

He collected for me three hundred and twenty-five pounds of seeds—including the dried skins. The method, according to my directions, was to select matured bunches, to crush the berries, without injuring the seeds, to press out the juice carefully by hand so as to prevent fermentation and to dry the remainder in a shady place.

He also conducted experiments in making wine from portions of the grapes, which first demonstrated that there were several varieties of these wild grapes.

There were noticeable different colors in these grapes when picked, but this had generally been attributed to different degrees of maturity. I have, however, sampled three different wines made from these grapes, which vary so much in general characteristics that I am convinced that they are the products of distinct varieties. One was of a light reddish brown color, another port like, another violet purple. The last had such an abundance of coloring matter that a small addition of it to a glass of white wine was sufficient to impart a brilliant claret color. When I submitted it to Mr. Arpad Haraszthy for his opinion he pronounced it, without hesitation, a fine claret wine, and remarked, "They will plant that vine yet in Bordeaux by the million!"

Mr. Mattier thinks he can distinguish five distinct varieties among the vines in his vicinity.

The seeds which I have, upon examination, disclose marked, distinctive peculiarities, notwithstanding a common type prevails among them. Some are grayish colored, same bright reddish, others dull coffee brown, with varying shades between these. The dark seeds, coming from the dark grapes, predominate. Some are also, no doubt, immature and worthless.

HOW TO USE THE SEEDS.

For the purpose of producing seedlings for grafting stock, I presume that there can be no material difference in the value of these seeds. All of them are from a district uncontaminated by a possible hybridization, excepting such as may have happened naturally among the wild vines in the state of nature. The vines from which they were gathered exhibit remarkable fecundity as well as luxuriance of growth. Some cover trees from fifty to seventy-five feet high, and produce at least one hundred and fifty

pounds of fruit each. It is to be expected that when these vines are cultivated and properly pruned, the fruit will improve.

The seeds may easily be germinated in light sandy loam, or any soil which would be suitable for nursery purposes. In order to obtain the complete value of perfect roots, the best method, no doubt, would be to start the seeds in boxes, or under glass, in February or March, in the same manner that tomato plants are raised; then as soon as the vigorous young plants can be determined, which would be within two months, to transplant them carefully into the vineyards where they are to remain. In this way the roots may be suffered to grow undisturbed and the plants may be grafted in place the next spring. In case some have failed to grow their places may be filled with seedlings one year old from the nursery and grafted at the same time. The seedling (fig. 2) shown in the accompanying plate, was carefully taken from the ground, six months and a half old. In ordinary work, most of its roots would have been shortened, and its perfection when transplanted would be impaired, although in any event it would be superior to a cutting.

In the most cases, however, it will be considered impracticable and as a process too slow to use the seedlings transplanted from boxes or hotbeds. Most farmers will prefer to obtain their plants of the one year's growth in nursery. They will have the advantage of selecting only the most vigorous growers, and can graft them before planting.

Common farmers' sense will indicate how to manage a nursery. I should say, sow the seeds in rows in loose, deep soil—moist, but well drained, after the manner of sowing carrot or beet seeds. If the plants come up irregularly a little labor can be profitably used in redistributing them by removing some from the crowded places to the spare spaces. If the rows are eighteen inches apart, and the plants from four to six inches apart in the rows, about sixty thousand may be raised on one acre. At the end of one year, if all are not required for transplanting, the alternate rows may be taken up, leaving ample room for cultivation.

HOW MANY SEEDLINGS MAY BE REQUIRED.

It is the practice in this State to plant vines about one thousand to the acre. Forty acres would require forty thousand plants. In the Sonoma valley six hundred acres have been destroyed by phylloxera; it would require six hundred thousand plants to replace them. Thousands of new acres are to be planted in Sonoma, Napa and other counties. To ensure them against the future attacks of the dreaded plague, prudence would advise viticulturists to put a foundation of sound

and perfect roots under their vines. It is plain to see that if this principle of using wild vine seedlings prevails, millions of plants will be required and that there is no danger lest nurseries should become overstocked. As soon as the experiments have progressed two or three years, and we have found out what the French have discovered already, it will probably be impossible for the few who have had the foresight to plant seeds to supply the demand for seedlings.

No doubt a market may be found in France for millions of plants from this State. They have now *three billion* destroyed and sick vines to replace.

A nursery cultivated for three or four years would also furnish an abundance of cuttings, if required, in preference to seedlings, which could be more profitably obtained in that way than by seeking them at the tops of great trees in the wild state. It would be a great task to obtain 100,000 cuttings from the wild vines, while they might be easily taken from a quarter of an acre of three year old vines in nursery.

I have counted small lots of the seeds which I have, and find that they average about 8,000 to the pound, the crushed and dried skins remaining among them. The whole lot collected for me contains about 2,500,000 seeds. I should expect to waste at least one-half the seeds in sowing them, because many of them stick together, glued to the skins, and, under any ordinary circumstances, they would fall unequally in sowing. A great many plants would require to be thinned out and destroyed. The immature seeds would not germinate. I should estimate, therefore, that twenty pounds would be needed for an acre nursery. If started first in boxes, or hot beds, they might nearly all be saved in transplanting, and one half the seeds would suffice. I should think that even when starting a nursery, it might be best to sow first under glass and transplant only the most vigorous, as soon as they are developed sufficiently.

WHAT WILL BE DONE THIS YEAR.

I have already distributed portions of the seeds collected to Mr. Chas. Kohler, of Sonoma; Mr. G. Groezinger, of the Napa Valley; Prof. Hilgard, of the State University, and Mr. John L. Beard, of Centerville, one of the Regents of the University, and a skillful farmer.

About an acre will be cultivated in seedlings at Berkeley. Mr. Beard will do as much and more to provide for his and my personal use next year.

The question of expense has not troubled me in this matter, because I deem this reform of such vast importance to the future of our

vineyards that I am only anxious to have the experiments started as extensively as possible, so that there may be a large number of plants for sale or distribution, as soon as our farmers have become satisfied with the soundness of the theory advanced.

I have therefore put up one hundred half pound and fifty pound packages for distribution to whomsoever will demand them in this State, and Mr. A. D. Bell, the proprietor of the MERCHANT has kindly agreed to distribute them for me. I feel no hesitation in appealing to our intelligent viticulturists and farmers to assist me in making these experiments as general as possible, and in asking those who are willing to do so to write to Mr. Bell for seeds. I only ask that the seeds may not be wasted and that next fall all parties having germinated them will notify the President of the State Viticultural Society—Mr. Arpad Harazthy, or his successor in office—stating what results they have obtained, kind of soil in which plants are growing, and what disposition they desire or intend to make of the seedlings they have, so that, if offered for sale or distribution, those desiring them may know where they may be obtained.

I shall send some to France to the Viticultural Union of the Entre-Deux-Mers, where they have been desired, and some to the Agricultural College at Montpellier, in the Department of the Hérault, where more than two hundred varieties of American vines are now growing.

DESCRIPTION OF THE ACCOMPANYING PLATE.

In order to illustrate the different principles of propagating vines, I have prepared the accompanying plate, lithographed by Edward Bosqui & Co., the explanation of which is as follows:

Figure 1. Seed of the California wild vine from Harbin's Springs, magnified six times.

Figure 2. California wild vine seedling, nearly one-half natural size; seed sown April 7th, 1879, near Harbin's Springs by Mr. C. Mattier, transplanted June 2, and taken up finally as shown in figure, in October, being then less than seven months from the seed. It shows the system of roots peculiar to a seedling, and the leaf peculiar to the *vitis Californica*. The vigor of the plant cannot fail to attract attention. If Lake County can produce this much what may not more favorable places do?

Figure 3. Bunches of wild grapes from old vines at the same place, nearly one-half natural size. Perfectly matured; very dark or shining black; taste agreeable acid; no trace of any flavor similar to wild grapes of States east of the Rocky Mountains.

Similar in vinous qualities to the grapes of the Medoc, which produce the most famous clarets.

Figure 4. Illustration of roots developed from a foreign cutting two years old—copied from a French work. It shows that cuttings produce only lateral systems of roots and exhibits an inherent weakness by reason of the lack of a constitutionally perfect root system. The main trunk of the root is a portion of wood grown above ground, which never partakes of a true root's character. It may be liable to disease, and, if affected by worms, or rot, between the upper and lower lateral roots the lower system must necessarily be cut off from the plant above. The destruction of any one of the seedling roots, however, need not affect the others, which all tend to strike deep into the soil.

Figure 5. Illustration of a short section of a cutting, full size, with only one bud, intended to be planted in the manner of a seed. This method of propagation has been experimented with, but has not obtained any general use.

Figure 6. Illustrates the development of a bud cutting, one year old planted after the manner of figure 5, at the College at Montpellier. It is copied one-sixth natural size and shows that the roots thrown down are similar to those of a seedling. The French call it *bouture semis* (cutting-seedling). In this particular case, the root was thrown down fifty-four inches and the wood made above ground was thirty-seven inches.

The superiority of the roots of the seedling must be manifest to even a casual observer. I believe that most, if not all the diseases pertaining to the roots of vines are owing to the vicious practice of propagating the same vine for centuries by cuttings only. Their roots are constitutionally defective and weak.

THE WILD GRAPE AS A WINE GRAPE.

I think there can be no doubt of the value of our native wild vine for grafting stock and for this purpose I do not hesitate to recommend its general use, either by cuttings, or seedlings. But the experiments made for me by Mr. Mattier during the past grape season, have convinced me, as well as others who are experts, that the crowning virtue of this vine is its value for making claret wines. I should not hesitate, if I had a vineyard to plant in any of our northern, or central counties, to cultivate this vine for the sake of its fruit. I believe it will supply the greatest desideratum in our wine making and is destined in the future to make the clarets of this State famous. It produces tannin and tartrate of potash, has no striking aroma, is sufficiently neutral and has no disagreeable taste whatever. The viticulturist who plants

a vineyard with these vines, need not fear any serious loss by experimenting, because, if he is not finally satisfied with the fruit of the vines when cultivated, he can graft them whenever he pleases and be sure that he has a superior foundation for his vineyard.

I have ascertained by examination of my seeds that the dark coffee brown colored ones come from the darkest grapes and that the light colored, yellowish and grayish ones come from light colored and immature grapes. Those who desire to separate any samples they may receive may do so, following this rule. It may be the colors are due only to different degrees of maturity, but my opinion is that the varieties are different and that the darkest ones are the most valuable, if the object is to propagate for the fruit and not for the grafting stock.

SEEDLINGS OF EUROPEAN VINES.

I am convinced by the testimony of those I have consulted in France and also in this State, that the general failures to reproduce varieties of grapes by seedlings are owing to the selection of seeds of choice improved, or hybridized grapes. If we could tell which among our European grapes are pure stocks, I believe they could be propagated and reproduced without failure from the seed. As this is to me a study of grapes for wine making, and not for table use, or raisin drying, I think the problem is an easy one. The best wine grapes are those which appear to be the least perverted from the natural state by cultivation or hybridizing, and these will probably respond favorably in seedlings.

I have a theory which has considerable evidence to base itself upon, that the best known wine grapes are the nearest to the original wild condition and consequently pure stock. The history of the Bordeaux grapes goes back to where the memory of man and tradition cease to quote facts. They were cultivated in the Medoc at the time of the Roman conquests. Tradition says that the French vines came from Greece. Perhaps so; perhaps, however, only a part of them came from the Orient. The belief that many of the varieties were indigenous to the country is gaining ground.

I found at Bordeaux that the claret grapes reproduced themselves from the seed. They are poor things to eat and not more palatable than our wild grapes. Yet they make fine wine.

In trying to trace up the origin of our Zinfandel grape, which we have been told came from Hungary, I fell upon some curious information, I consulted Count Odart's celebrated work, *Ampélographie Universelle, ou Traité des Cépages les plus Estimés dans tous*

les Vignobles de quelque renom, published in Paris in 1873. I expected to find the Zinfandel described as a distinct variety of vine. I found, however, that the word signified simply *wild vine*, and that while we might have only one variety, there were many Zinfandels. The word has been corrupted in California from Szirifandl, or Zierfahnl.

I found in Count Odart's work, under the head of "Austria," a chapter entitled,

SILVANER OR SZIRIFANDL.

The writer says: "This tribe, if it may be called such, is composed, in distinction from others, of subjects which have, for the most part, no affinity among themselves, and have nothing in common except their sylvan origin. For instance, I have received from the Luxembourg collection one variety of great value, under the name of the Gleb Szirifandl, and at the same time from Mr. Demermetry's collection the same variety under the name of Grün Muskateller and Grün Manhard Traube. As I have already written enough of that variety, I pass to other Silvaners, or Szirifandls.

"Grün Silvaner, or Salviner (along the Rhine), Oestricher, Schwabler, Grün Frankisch; Grün Szirifandl or Zierfahnl (Hungary); there are even several other names for this variety, but it seems to me that these are sufficient."

Count Odart then refuses to admit the identity of this vine with the Muskateller, the Meslier, the Picarneau or the Gueuche Blanche, as some had done. The Silvaner, he says, is fertile, ripens early enough, and is agreeable to eat. Its vinous properties he considers poor. It will be seen that he finds the Silvaner of the Rhine to be the same as the Green Zierfahnl of Hungary. Next he classes—

"Roth Szirifandl or Zierfahnl—Silvaner Rouge" (Red Zinfandel or Red Silvaner), concerning which he says: "It is under the first name that I have received it, and I would not dare to decide that it is a variety of the preceding, notwithstanding what Baron Babo and Metzger, German Ampelographists, say of it. It is always represented to be a very good grape to eat and as good for the wine cellar, according to those authors. I have not enough plants to make wine of it separately, but the excellent Mr. Burger, another German Ampelographist, whom I saw in Vienna in 1839, has boasted of its aptitude to make good wine; he told me then that it was the plant most used in the well renowned vineyard of Gumboldt Kirchen. The bunches are not large, the berries are round, of a color light red, juice very sweet and very agreeable. I have told its advantages, I must not keep silent upon

its great defect, which diminishes them; it is very sensitive to the winter and spring frosts.

"I shall only cause to be remembered the Burgunder—vineyard of Jungholz, near Guebwiller (Upper Rhine), or Blauer Silvaner—much cultivated in Wurttemberg under the name of Blau Bodensee Traube, according to Baron Babo, although even he, who knew it well, refused to admit in the tribe of Silvaners. I will remark here that these names Silvaner, Szirifandl, signify *found in the woods*; therefore there might be others of this name and which may not be of the same family.

"The Riesling, or Riesler, is also found in these vineyards, but in less degree than on the Rhine.

"The wine of Margrave, or the Duchy of Baden, is made from three kinds of grapes, called Woelsch, or in other parts of Germany

GUTEDEL,

The German author, says that these are our Chasselas, but I have good reason to believe that they are principally the Fendants of Switzerland, the wine of which, at the vineyard of La Vaux, sells even up to 500 francs per barrel. We are told that they mix these grapes with the Mosler, which is the Furmint of the Hungarian, and the Verbouschegg, without giving any description of these two plants.

"The Maerisch is served upon the table in the duchy of Baden, and its maturity is early, like the Portugieser, which is also much cultivated for the table, as well as for wine making. They tell us nothing about the Maerisch, and I am not acquainted with it; but I cultivate the Portugieser, which will have its chapter under the head of grapes for the table.

"Burger, Elbling, Allemand, Faun—I had omitted this variety in my first editions, in consideration of the little value of its vinous qualities; but, as it is very much cultivated by the small vineyardists on the Rhine, I have decided to give it a place here. Its product is abundant, no doubt, but it is its only advantage, and its bunches of round berries, being of a flat sweetness and without vinosity, give only a mediocre wine; in fine, these are varieties which should be left to our neighbors, for I could have made a tribe of them, since there are several varieties, especially a red one which I possess."

This very imperfect chapter proves only that tradition has attached to certain well known varieties of vines a sylvan origin. It means that the Zinfandels, Rieslings, Guttedels and Burgers are wild vines cultivated. How many more there might be found is impossible to say, but probably the Bordeaux

and the Burgundy grapes would come under the same head.

With this distinction in view, our California wild vine might be classed as a Zinfandel.

The important fact I gather from this study is that the vines which indicate a pure and simple sylvan origin prove to be in this State our best wine grapes.

If the Zinfandel, Riesling, Gutedel and Burger are pure stock, we may expect to improve rather than deteriorate them by planting seedlings, and that the average result of a vineyard planted with Zinfandel seedlings would be an improvement. In corroboration of this, Mr. G. Groesinger tells me that he knows of Zinfandel seedlings in the Napa Valley from which he has made wine identical with the Zinfandel so commonly known.

I recommend therefore that experiments should be made to test the practicability of reproducing our best wine grapes from seeds. We may be sure that when we find the varieties which regularly reproduce themselves, we have found pure, sound stocks, and that the best way to plant a vineyard will be to use their seedlings. This I am convinced ought to be done with our Zinfandel. In that way viticulture would progress instead of retrograding as it is doing now throughout the world by reason of the exhaustion caused by using cuttings only. If any farmer should be dissatisfied with a vineyard of Zinfandel seedlings, he can easily graft them and be sure of good roots to maintain his vineyard.

FRENCH AUTHORITIES ON SEEDLINGS.

I have searched everywhere among the books on the vine for something about seedlings, and what I find is very little. There is very little known on the subject, and the future is full of discovery.

In the *traité de la culture de la vigne*, by B. A. Lenoir, I find an interesting chapter. The work antedates the phylloxera epidemic. What the writer says should be exceedingly interesting in California, where the object should be to obtain vines, native to the soil, modified from the seed to suit a new climate and new conditions of growth.

Mons. Lenoir says: "The seed is the surest and promptest means of obtaining varieties of a vegetable. We have a thousand proofs of it, and yet we have scarcely tried this method with the vine. Although I have made great researches on this subject, I know only four facts relative to seedlings of the vine.

"The first is cited by M. Bosc, art. *vigne* of the *cours complète d' Agriculture*:

"M. Van Mons, of Brussels, has obtained by a grape seedling, a variety as large as a

strong *Reine-Claude*, which ripens, at the latest, in the first half of August, and which never fails to produce. Its juice is very consistent and sweet.'

"This fact is very remarkable. Brussels is situated in a part of Belgium where they can not cultivate the vine in the open field. * * The seedling has produced a variety, of which the maturity is precocious and complete. What might not one expect, after that, from the same means in a happier climate?

"The second fact is reported by Rozier, Art. *espèce*, of his *Cours d' Agriculture*:

"A person near Lyons has planted seeds of grapes (I do not know of what kind); he has made of them a vineyard, and the wine which it produces is not subject to the malady which afflicted the preceding vines.'

"Rozier says nothing more about it. How was it that a fact so extraordinary, so fertile in consequences, did not attract all the attention of the man who sought with the greatest care all that could relate to the culture of the vine? * * *

"The author of the article *vigne*, in the edition of the Dictionary of Rozier, printed at Montardier in 1802, says:

"One may also make use of the seeds; but this latter method appears too slow. Buhamel asserts that a vine raised from the seed had not yet produced at his place any fruit after twelve years of culture.'

"However a fact mentioned in the same article, proves that we cannot obtain any conclusion from the sole experience of Duhamel; the non-fructification of the plant, coming from the seed with him, might be accounted for by the nature of the variety which furnished the seed, by local circumstances, and especially by the mode of culture to which the plant had been subjected. Here is the passage:

"A seed of this grape (the *verjus*) planted several years ago in the garden of the Chevalier du Jansens, at Chaillet, near Paris, has produced a variety the fruit of which comes to a perfect maturity. Its shoots push out with an extreme vigor, and cover already a great part of the walls. The fruit of this variety is excellent; it bears, no one knows why, the name of the *vigne aspirante*.'

"A variety which, in the climate of Paris, yields grapes which never ripen, or which acquire in the warmest years only a sweetish flavor, has produced in the same climate, by the seed, a variety the fruit of which attains complete maturity and is excellent. And in a long article on the vine, where such a fact is cited, no induction is drawn! This fact, however, bears in itself the germ of an entire revolution, which will break out sooner or later in our vineyards."

Further on I find a passage which com-

pletely supersedes the Montpellier gentleman whom I referred to in a letter to the *Alta*, as claiming the glory of inventing the idea of grafting upon American vines. It is as follows:

"I do not exclude from these essays the species which are still in a wild state. There are several, especially in America, which yield fruit sufficiently good, which, by cultivation, would yield better. These kinds, multiplied by seeds, would produce, perhaps, very interesting varieties, were it not only on account of the property of resisting intemperate seasons, which the kinds to which they would owe their origin support very well under the most variable climate of our hemisphere. These species would communicate, perhaps, by means of the graft, their robust temperament to our vines. The American vines are all *dioïques*; it is a question whether they would support the graft of our vines. It is an experiment very easy to make, and merits being made."

Here let me remark that the viticulturists of the Eastern, Western and Southern States, who, failing in cultivating the European varieties after repeated efforts, have made such wonderful progress with the wild vines, ought to excite by their examples some spirit of emulation among the people of California, who have everything favorable to vine culture, and yet are quite content to borrow varieties from Europe, which never produce the same wines in different places. In California we have the advantage of the growth of the superior European vines; we should now try to acclimate them through seedlings, and possibly to regenerate and improve them.

The principal thing to remember in growing seedlings is that the nature of the plant must be consulted with reference to pruning. If it needs to have support, its growth will indicate it. Some vines, in the wild state, climb over tall trees; others grow low to the ground.

In 1867, before the phylloxera had attracted public attention, in a work entitled *La Vigne*, by Romualdo Dejernon, published at Pau, near the Pyrenees (Auguste Lafon, No. 3 Rue Henri IV.), there is an interesting chapter on seedlings. In one paragraph he suggests the increased vigor of the naturally reproduced plant:

"The plant, issue of the seed, is always the best, has the most life, that which should preserve for the longest time superior qualities. The multiplication by seeds yields subjects more robust, varieties less rebellious to new climates to which one wishes to habituate them." Again he says, as if in prediction of the present question of phylloxera, "the seedlings are also excellent to regenerate a race of vines exhausted by a long

succession of multiplications by cuttings. They furnish, also, for the graft, subjects much more vigorous and of longer life than those which it is possible to obtain in any other way."

But we are in danger of losing many varieties by natural decay, without counting the effects of phylloxera. Mr. Dejernon says: "We have no longer the varieties which yielded the great wines of antiquity; the *furmint* of Tokai, the *sirrah* of the Hermitage, have lost their force and vitality; therefore, varieties disappear. Pliny could find no longer the plants cultivated in the time of Cato; neither could Olivier de Serres those in honor in the time of Pliny; and we ourselves have lost more than the half of the varieties described by La Quintinie."

THE BUD SEEDLING.

The same author describes the invention of a peasant, Hudelot, which has proved a success. It combines the idea of a seedling and a cutting. In the Fall or Winter, healthy, vigorous canes of the vine are selected; each bud, or eye, that appears well developed, is separated by cutting the stem across, leaving a section about an eighth of an inch on each side of the eye. In the Spring these buds are planted just as seeds are, in light soil, about an inch and a half or two inches deep. The result is claimed to be a vigorous plant, partaking of the unity between roots and upper growth that the seedling exhibits, and at the same time preserving the exact type or variety of vine.

Dr. Duyot, in his work on the vine, commends this plan of reproduction. He calls it a graft and a seedling accomplished at the same time. It is worthy of experiment in California.

Mr. Payen has experimented with a modification of this plan by taking the bud, or eye, with a portion of the adjacent bark and wood, scarcely more than used in bud grafting. The results of comparison are that the Hudelot system insures stronger and larger pivotal roots, while the other produces more numerous rootlets, and has produced fruit in the second year.

INSTRUCTIONS FOR PLANTING SEEDS

Are to be found in the work of Lenoir, and in a recent pamphlet by Mr. A. H. Trimoulet, of Bordeaux (Eleventh letter on "The Phylloxera")." Mr. Trimoulet quotes the method of M. Vibert, pepinierist, of Angers, which appeared in the thirteenth year, No. 1, of the "Bulletin of the Industrial Society of Angers."

It is a fact worthy of remark that the favorite American vine now cultivated in France—the *Jacquez*—is being obtained from cuttings of the Lenoir variety of Texas, now

considered to be the same. Whether it was named after Mr. Lenoir, whose work I have mentioned, or whether it obtained its name (*le noir*) from its dark-colored fruit, I do not know; but it is singular that the great writer's predictions should be first verified with a plant bearing his own name.

THE PHYLLOXERA IN FRANCE.

While I was in Bordeaux in 1878 I wrote as follows:

The vines of the Gironde have several critical periods to pass through each year, notably among which are: First—the season of frost; Second—the season of dew; Third—oidium, and all the time the season of phylloxera. The frost affects buds and the tender leaves; the dew, falling upon the flowers and succeeded by the warm sun-rays, kills many of the germs of the berries and reduces the crop; the oidium, a kind of fungus, attacks the fruit, shrivels and rots it before maturity. In the Medoc, this year, the oidium has greatly reduced the crop, and in the region of Sauternes the dew has done much damage. I have to-day learned that the product of Chateau Yquem this year is only fifty-five tonneaus—13,200 gallons—instead of the average yield of 28,800 gallons; this decrease is caused by dew principally. The oidium, which, for a number of years almost destroyed the French wine interest, completely destroyed the Madeira, and was the occasion of introducing the American vines into France to experiment with, is combated by means of sulphur, but the results show that the vines are still subject to the disease. The phylloxera is only another proof of their weakness.

I have already described the ravages of the phylloxera in the Cognac country, which is the extension of this region to the north and northeast. These ravages extend down to the banks of the Garonne and the Gironde, covering four-fifths of this Department, where not more than a third of a crop is obtained at this vintage. The west side of the Garonne, on the edges of the great Médoc, Graves and Sauternes vineyards, is also affected in numerous places, but here the progress is not rapid.

Neither richness nor poverty of soil seem to have any close connection with this question. In the Charente and in the valley of the Rhone the soil is what we should call poor; there the phylloxera revels. In the *palus*, the bottom lands of this region, where the soil is very rich and the vines grow apparently thriflily, the phylloxera also revels. But where the vines produce the finest wines, there the phylloxera advances slowly and seems checked. The regions of poor wines have been devastated. No great vineyards

have yet been ruined, unless we count as such the vineyards of Frontignan, in the Midi, where sweet muscat wines were produced, famous as *vins de liqueurs*.

I know a great deal more about this question than when I first began to study it. I have in fact "gone the rounds" of all the various theories and experiments. Much that I wrote at first I should now modify; but, in the main, the essential principle, which I at first pointed out, remains intact—the question of vitality of the vine.

The finest vineyards have escaped so far, not by reason of especial precautions, but by reason of some natural immunity, or special condition, which has not yet been explained. The plague surrounds the Médoc, Graves and Vins Blancs, except on the west and south, where no vines grow. It has been for several years in spots in these districts, but does not seem to spread seriously. It is not a question of the variety of vines, because the same varieties have succumbed in other parts. The fact remains that where the vine first demonstrated success, it continues to hold the ground. The pest has jumped over the fine Burgundy district into Switzerland and Germany. It is working only slowly into Burgundy vineyards.

It is impossible to draw satisfactory conclusions from even the official reports of the various committees in different parts of France, each of which is especially the friend of some single remedy. All remedies fail in general, and all succeed in particular. Such is the general conclusion I reach after reading scores of pamphlets.

There are two prominent classes of opinions. Those engaged in solving the problem, such as scientists and men specially engaged or connected by official relations with agricultural societies and committees, believe in and advocate this, that, or the other remedy. The practical vine-growers, wine merchants and people generally, unite in one common refrain, "*Il n'y a rien à faire*," ("There is nothing to do.") Scores of successful remedies, well attested, are announced; but few, except the experimenters, practice any of them.

This confusion is chiefly due to the want of harmony between those who conduct the experiments. The offer of a great prize by the Government and the cupidity of many who have nostrums to sell, have begotten a spirit of rivalry and contention; some contend for the prize more for the honor of discovery, still more to maintain hastily-formed opinions uttered early in the strife, and many more to advertise methods in which they have a speculative interest. This may account in part for the apathy of the people,

for when all the doctors disagree how can they believe in medicine?

The first cause of apathy on the part of vine-growers is, probably, because all proposed remedies contemplate either great expenses or radical changes in their vineyards.

The remedies may all be grouped under two heads: First, those which are directed simply against the phylloxera; second, those which come to the support of, or regeneration of the vine.

Practically, it may be said that all insecticides fail in checking the plague. Only those succeed in part and in exceptional places which are accompanied by either rich manures or improved cultivation.

The best attested successes are where the soil is treated with compounds of potash and nitrogenous manures; but these fail where the plague is worst, and appears irresistible. They succeed, however, often enough to demonstrate that the presence of potash and nitrogen assist the vine to resist the disease. Good results have been obtained by the use of simple carbonate of potash, wood ashes, and sulfo-carbonate of potash. The most remarkable result was obtained near Reole in this Department by the use of simple *chiffon*, the fine debris from a hat factory, cuttings and trimmings of wool—an animal and nitrogenous manure.

Let it be remembered that vines extract potash from the soil, which is not returned, and that vineyards are seldom well manured, and are generally in poor soils. For a long time there existed a law in France, prohibiting the manuring of vineyards. Lands suitable for vines have been cultivated, without resting, for centuries; so also have lands unsuited to such culture. The natural consequence is—exhaustion of soils. What that exhaustion is, cannot be easily determined, because underneath all speculations of chemistry, there is the vital principle, which cannot be renewed at will, and which no chemical study of manures can account for.

Every ordinary rule of nature has been violated in the culture of the vine. It is known to all agriculturists that, not only a rotation of crops is necessary to preserve vegetable fertility and health, but also it is desirable to change the seed from one district to another. This has not been done with the vine.

Again, there is the evil of over-crowding. What is true of human kind, is true of vegetation. Over-crowded communities of vines, as well as of men, may breed contagious diseases, by the violation of some hidden law of nature, which seems to have for its end the preservation of equilibrium on the face of the earth.

Independent of any theory upon the subject, this feature of vine culture must be considered as one of the conditions present at the time of the development and spread of this plague. Moreover, the phylloxera is not the only indication of conditions favoring disease. The oidium was, until the sulphur treatment was discovered, a worse plague than the phylloxera is now. But sulphur does not cure oidium; it only alleviates the trouble. The original causes remain and the sulphur treatment has become an annual necessity. So, also, with all the proposed remedies directed against the phylloxera. All of them, even submersion, have to be continually repeated. Everything, so far, indicates a radical source of evil, either in the vines or the soils.

As compared with all other multiplications of animal or vegetable growth, the culture of the vine in France has become overcrowded, and presents the primary condition, which, with mankind especially, favors the generation of germs of contagious diseases; diseases that commence in favoring places and afterward travel over the whole earth, even devastating places where conditions are most favorable to health. Such diseases yield to no specifics. People fight them with general sanitary measures, and use so-called specifics only as secondary aids.

The vine, however, cannot tell its own wants; cannot change its soil and climate, depends solely upon the cultivation; and the cultivator, practically, can do nothing successfully, because, generally, he aims to preserve the very conditions that have produced the disease, if disease it is. He tries to maintain the same number of vines upon impoverished soils, and opposes the regeneration of the vines themselves.

If this is a contagious disease, similar in general features to other contagions, it is enough to know there was good cause for it in France. The fact that it attacks places where such causes do not apparently exist, is not a good basis for argument against the theory, because the same is true of diseases that develop, spread, gain force and attack the human race; only, if the theory be sound, the attacks may be expected to do least damage, and to be least frequent, when the original favoring conditions are wanting, or are in less degree existing.

Strengthening the soil with the elements, which the vine needs, succeeds often; this is one step toward solving the problem. Everywhere in France I find certain of such remedies advocated, and supported by proofs of success, and everywhere, more or less, denounced as useless. Hence, it is apparent that, though if they had been applied in the

beginning they might have prevented the plague, they are not now specific cures.

I cannot derive much comfort from a study of soils. The general notion that sand is an obstacle to the phylloxera comes only from the fact that in certain places, where the vines are still safe, the soil is sandy. But this feature must be better understood. Such soils are simply sandy loam, where, centuries ago, it was found that the vine succeeded and produced the best wine. The absence of phylloxera in such places only furnishes another proof that the soil is good for the vine. But there are many other conditions present besides a sandy loam. The Medoc vineyards, which are still unaffected, have good drainage and furnish favorable conditions for the growth of healthy and deep roots; but the adjacent bottom lands are moist, with water near the surface, into which the vine does not like to dip its roots, and the roots, being near the surface, are easily attacked. The Medoc is also subject to the action of sea breezes and the influence of a sea shore. A sandy soil on hillsides favors deep rooting.

One of the rules for combatting phylloxera has been deduced from these facts and conditions, viz: deep cultivation and underground pruning to promote deep rooting. It has succeeded, like all other remedies, when tried by the man who advocates it.

The insecticides, such as the sulphide of carbon, succeed just as fumigation, etc., succeed in protecting otherwise healthy people from contagious diseases. It kills the attacking germs, which come again and must be killed again and again until the plague subsides. Where, however, the conditions appear favorable to the disease, the sulphide of carbon and all insecticides fail, because it is practically impossible to apply them effectively without killing also the vines.

It is only when we begin to consider the constitution of the vine itself that any confidence in results seems to be shown. I have already described the American vine theory, as advocated at Montpellier. It is gaining ground all through France, notwithstanding the greatest reluctance in substituting wild plants for the civilized vine. It is already the favorite theory in the parts of this section where the vineyards are ruined, and is scouted where the vineyards are still safe.

The principle reason for its growing popularity is because it offers an immediate means for reconstituting destroyed vineyards without the necessity of expensive and continuous annual treatments with insecticides, which are not often sure except under scientific supervision. It also offers a means for preserving the favorite French vines by means of grafting. This method finds also numer-

ous advocates who have not only a theory to advance, but profit in its advancement. Nearly all the advocates of American vines are making large profits by the sale of plants and cuttings. I could astonish my readers if I should reproduce some of the passages in the numerous pamphlets and books on American vines, extolling even the merits of the wines produced from them. Many of them assert positively that the wines, for instance, from the Mustang grape of Texas are superior to the finest French wines, and at the same time describe the method of making such wines as requiring the addition of sugar and alcohol to give them body. A witty opponent of American vines suggests that equal results can be obtained by taking barrel of river water, adding sugar and alcohol.

But nevertheless the American vine men are in the lead, and very soon there will be more American vines cultivated in France than in America. In this effort, however, each merchant is advocating the variety that he has to sell, while the experiments prove that the best, for the purpose, are the wildest original varieties. It will, therefore, become soon a question of supplying grafting stock.

But here we reach a new question which I have already touched upon. When in Paris, before studying the question in the vineyards, I happened to fall upon the mere suggestion of the idea of regenerating the vineyards by means of seedlings. It appeared to me to be so reasonable that I dwelt upon it with some force.

I inquired everywhere I went, asking where I could find authorities on the subject. It surprised me that I was everywhere repulsed. People, interested nominally in the problem of fighting the phylloxera, but really in advancing some pet notion, which promised, if popular, to become profitable, seemed to consider the idea as heretical in the extreme. At Montpellier, I saw rows of seedlings of French as well as American vines. I could see no difference in the results, but I was told curtly, without explanation or proof, that the European seedlings would not resist. It was true, no doubt, that many of them would succumb to the phylloxera; it was equally true of the American vines, for out of hundreds of varieties of the latter, only five or six are proof against the severe attack of the pest.

Persisting in my inquiries, at the risk of offending the savans, most of whom were speculators in American vines, I was referred to Mr. Bouschet, the noted *pepinierist*, as one who propagates by seeds is called. He told me so positively that the seedlings were failures that I lost nearly all faith in the idea. Since then I have learned that he, also, is a trader in American vines.

Prof. Foex advanced an interesting theory concerning the cause of the resistance of American vines, viz: The physical constitution of the roots affording protection on account of structure. But a distinguished naturalist here sagely remarks that Prof. Foex has compared under the microscope roots of young American with roots of old, exhausted European vines. The conditions of observation have not been the same.

The fact still remains that the European vines are the product of cuttings, through successive centuries, from vines, the original germs of which were planted centuries ago.

If it is a sound doctrine that these vines do not become exhausted in vitality by such methods of multiplication, then it follows that the primal law of nature has exceptions, and that, without regeneration by seed, the vine may be perpetuated forever.

I have, however, found some satisfaction here in the consideration of what I think may be properly termed the natural theory of propagation. If this holds true, it does much to establish the true theory of the phylloxera, as disease, rather than as the original cause of disease. Having found that support, through amelioration of the soil, aids the plant to resist, if amelioration of the constitution of the plant by natural means also adds to the resistance, the problem is practically solved.

But there are reasons for opposition to the method of regeneration from the seed, which must first be considered. The vine-growers know that by seedlings the character of the yield of the vines may be more or less changed. He fears changes. He thinks he knows that the roots of the American vine will resist and will support grafts; hence he is satisfied with the remedy. Every one can plant seeds; hence there is not so much advantage in that method to the promoters, who try to monopolize the field in selling new cuttings and plants. Phylloxera is, in all events, a disease, and the country is full of quack doctors and patent medicine. In California we have not a million acres of dead vines; two or three thousand million dead plants to replace; hence we can afford to be less excitable on the subject. We have new vineyards to create, instead of old ones to restore; hence we can well afford to begin with sound principles of multiplication and reproduction. We have no traditional vines and wines to preserve; hence we need not fear changes. We may, indeed, hope for improvements, for the vine has improved during past ages; the viticulturists of Eastern States have improved the wild vines, and we may do something, also, with the superior vines that are suited to our climate.

But I am happy to say that the question

is not entirely theoretical. It was, at first, certain accidental growths of seedlings in infected places that attracted attention to their superior constitutions. Since then, notwithstanding the opposition of quacks in phylloxera medicines, the real scientists have been making progress by beginning with natural reproduction.

There have been, I now learn, several experimental vineyards of seedlings commenced.

To begin with, I will explain some of the fundamental principles. A cane, cut from a vine, is well known to be hollow within. When planted, to reproduce its kind, or, rather, to continue its kind, it throws down no central tap root. This, alone, is a source of weakness, without considering the exhaustion of vitality by such methods. I have with me two samples of seedlings—one a year old; another two years old. Each has a strong tap root, heavier, longer and thicker than the wood made above ground. Such a root, even if the phylloxera is not to be considered as a consequence of exhausted vines, cannot easily be attacked by the insect. Hence, seedlings may be the best stock to replenish a vineyard, without recourse to cuttings, just as fine fruit trees are grafted on seedlings.

Experience is doubtful on the subject of reproduction of varieties by seeds. It is, no doubt, true that there are varieties which can seldom be reproduced. The Delaware grape is an instance of this. But this may be true in a greater or less degree with different varieties, in proportion as such varieties are more or less true to their parent plants.

Seedlings, also, do not grow with equal vigor; some are more delicate than others. This is true of all reproduction. The child is generally, but not always, destined to outlive the parent, and the hybrids of races are generally weak. A friend writes me that "that seedling theory won't hold," because the Catawba and Isabella yield to the disease, and yet are new varieties, and, consequently, young. In answer to this, first, those varieties are said to be hybrids of European with American vines, and, perhaps, weak on that account; second, it is not to be expected that all improved varieties shall be vigorous, healthy plants; third, there are instances in the vicinity of Bordeaux where these varieties succeeded in the midst of infected districts, but no wine merchant has them for sale; fourth, perhaps, after all, the superiority of a seedling consists in the original plant, and not in the after-reproductions by cuttings, such as all the recent plantations of Catawbas and Isabellas are.

But exceptions do not make, they only prove rules.

The Viticultural Union of the Entre-deux-mers in this Department is experimenting with all the proposed remedies. The annual report gives the results of insecticides, potash, and all kinds of manure, cuttings and also seedlings. There are, side by side, cuttings of the wild vines of France, as well as of the vines of America, and seedlings of all varieties. The results of seedlings and wild vines, and the failures generally of methods to protect old vines, have led the Union to decide positively in favor of seedlings, and to declare that the phylloxera, as an epidemic, is the result of several causes combined, chief among which are exhaustion of soil, overproduction, and exhaustion of the vine.

First, there is the experiment analogous to that of the American vine. Cuttings were made from wild vines growing in this district. Such vines were considered unfruitful and useless. The young plants succeed, resist the phylloxera equally with the American vines, and this year, the third of their growth, have yielded abundantly not wild grapes, but fine bunches, similar to the product of the vines in the Médoc.

Two conclusions are drawn from this fact: First, that the wild vines, being seedlings, partake of the same vital vigor as the American vines, which are seedlings, or cuttings made in recent years from seedlings. The College at Montpellier has not extended its operations seriously outside the range of the stocks of vine speculators. There is no sample of the wild vine of California (*vitis Californica*) in the collection there, notwithstanding it is the vine of a country whose climate agrees with the constitution of the European varieties. The Union of the Entre-deux-mers is desirous of procuring cuttings from the California vine, seeds, etc., which I have promised to forward.

The second conclusion is that good fruit may be obtained from wild vines, when cultivated, sometimes, at least. The American vine-growers have demonstrated the possibility of improving the product of wild vines. The wild vines of this region are, perhaps, only accidental seedlings of the cultivated vines. If this be true, the result demonstrates the possibility of reproduction by seed. For this reason, I have arranged to procure seeds of the principal varieties grown here. After all, it may be that these Médoc vines are native grapes. Their history goes back to the days of the Romans, and they bear local names in the *patois* of the country. They have been reproduced by cuttings so long that longevity is certain, and it is a rule to select seeds of vines from plants, the vari-

ties of which have been the longest known. Having demonstrated thus far the superiority of cuttings of different vines near to the original seedling, the next question in this direction is that of simple seedlings. At the experimental vineyard of the Union mentioned, there are thousands of seedlings, from one to three years old, the products of seeds of all the well-known varieties of this country, as well as of American and French wild vines. These seedlings are in a flourishing condition.

I have had several long consultations with Mr. Trimoulet, the Vice President of the Union and the especial advocate of the seedling theory. He has given me copies of his pamphlets, and reports of the Union. He thinks that generally, when seeds are taken from vines, where the varieties are not mixed, the new plants will reproduce the original. But here he stops, and, as it appears to me, suggests a plan very much superior to that of the American vine advocates. He advises the planting of seeds, taking care to select from fruit which has not been exposed to accidental hybridization. This can be done as easily as carrot seeds can be planted, and in about the same way. Improved methods may be suggested for the careful and experienced seed-gardener. The soil needs to be light and well drained. At the end of one year, select only the vigorous plants and set them out in the vineyard, which, if once infected by phylloxera, should be first disinfected. The vine-grower can, in the spring, after the second year, graft these seedlings, and so have old varieties preserved on kindred and healthy roots, or he can leave them to develop to the time of fruiting, which takes place on the fourth or fifth year. He can then select those he wishes to retain for the sake of fruit, and graft the rest. From strong and vigorous productive vines he can have superior grafting material. Or he may graft the young plants in the second year, immediately upon removing them from the nursery, and obtain fruit in the third or fourth year.

This method, if pursued, would in a generation cause the complete regeneration of vineyards. The reader should remember that the best grapes for wine-making are not such as he is accustomed to see in California fruit stalls. The best wine grapes are not attractive to the palate, and seldom to the eye. Hence, the product of a seedling must not be judged by the first appearance of its fruit.

In the reports of the French Department of Agriculture for July of this year, on the subject of phylloxera, I find, among others, one which treats in part of seedlings, as experimented with in another district. These reports of the Department contain epitomized

statements from all the different sections. The reporter in this instance refers to two classes of objectors—first, those who say that seedlings of European vines do not resist phylloxera better than the vines from which the seeds come; second, those who complain that seedlings are slow in fructification. The answer to the first is that all seedlings have not the same vigor, and it is necessary to select the strongest. The answer to the second is that the seedlings may be used to graft upon, and may be obtained cheaper than American vines.

"However," he says, "a vine, two years old from the seed, may, by the English graft, be grafted upon in the Spring, and will bear fruit the next year, just as vines from cuttings. Indeed, this operation of grafting in the Spring, which follows the plantation in place of young seedlings of one year, is practiced by Mons. Duclaux, pepinierist at Draguignan, with almost constant success. As to the resistance of the seedlings to phylloxera, here is the interesting experiment, which is due to Doctor Dugat, of Orange:

"His field of experiments, surrounded by vines attacked by phylloxera, was divided into four parts in 1872.

"The first, planted in vines of the district (cuttings), perfectly healthy.

"The second, with cuttings of wild vines collected on the banks of the Rhone.

"The third with seedlings.

"The fourth with *sarmens* (cuttings rooted before separation from the vine) from the hillsides of the Hermitage.

"In 1877, the first portion had a mortality of 1 plant in 8; the second, 1 in 4; the third, 1 in 50; the fourth, 1 in 10.

"The victory remains, then, after six years, to the seedlings, which show a mortality of only two per cent."

It is perhaps true that by means of cuttings from European vines we cannot expect to obtain plants thoroughly acclimated in California. What may we not expect by propagating from the seed which European cuttings bear in our climate?

I have suggested the idea of a change of seed to Mr. Trimoulet, who is now anxious to experiment with seeds of European vines grown in California. Our climate has had good effects upon the eggs of silk worms; perhaps it may produce a constitutional rejuvenation of the vine through the seeds.

IN CONCLUSION.

The opinions expressed in the foregoing paragraphs relating to the phylloxera, I have no reason to change now, although I might easily modify them, as I have done in the first part of this article. I submit them altogether for the careful study of our viti-

culturists, hoping only that the general line of the argument may be in the right direction.

HOW TO SEPARATE DEFECTIVE SEEDS.

Since writing the foregoing article, I have found that about one-half the wild vine seeds, which have been collected for me are "lights," or dead. These may be separated from the sound seeds by immersing them all together in water, to which some salt has been added. The "lights" will float and can be taken off and thrown away. The sound seeds sink to the bottom. I have, by careful count, found that there is an average of four thousand sound seeds to the pound; hence by careful sowing the estimate of twenty pounds to the acre for a nursery need not be changed. The "lights" include the coffee-brown, reddish and yellowish seeds, having less distinctive peculiarities among the sound seeds to judge varieties by.

CHAS. A. WETMORE.

Professor Hilgard on Propagation of the Wild Vine.

UNIVERSITY OF CALIFORNIA,
Feb. 23, 1880.

EDITOR MERCHANT: I have read with great interest, in your issue of 20th inst., the able article by Mr. C. A. Wetmore, on the propagation of the vine, and the question of rendering our vineyards proof against the attacks of the phylloxera. Mr. Wetmore grapples with the problem from a point of view which has been too much neglected in the eager search for a remedy of the allopathic sort, that would secure the prize offered by the French Government; while the study of the possible causes of the exemption of certain kinds, has been attempted only by the least promising line of approach—the microscope.

Of the two main points upon which Mr. Wetmore bases his recommendations, one, viz: the resistance of wild vines, and of varieties not far removed from them, is incontestable, and is the cornerstone of the plan for the regeneration of the devastated vineyards of France, now being rapidly put into practice in that country. His identification of the "Zinfandels" as essentially "sylvan" varieties, is most interesting and important. Although the grape variety known by that name in California is not proof against the attacks of the parasite, it is certainly not as susceptible as the Mission and Muscat; moreover, it may itself be not altogether a pure, unhybridized stock.

However this may be, the well-known tendency of seedlings to revert toward the original wild stock, would alone serve as a strong

recommendation for their use in the propagation of vines intended to be grafted on other roots. The additional point made by Mr. W., that seedlings as a rule have stronger and healthier roots than cuttings, and will on that account alone offer greater resistance to attacks of all kinds, involves a principle that *a priori* will seem reasonable to every one familiar with the business of propagation of woody plants by the several possible modes.

When, in addition, we consider the possibility that among cultivated seedlings of the California vine, we are quite as likely to discover choice wine grafts as among those from which the Norton, Taylor and Isabella were selected, the importance of testing thoroughly the behavior of the native vine of California under cultivation, becomes obvious, and I shall consider these experiments, now inaugurated with seed kindly supplied by Mr. Wetmore, as among the most important on our experimental grounds. Unfortunately, we are unable to fruit any vine at Berkeley in the open air; hence the question of the quality of fruit produced must be tested elsewhere, by careful and reliable viticulturists to whom the seedlings will ultimately be distributed.

I have heretofore repeatedly urged upon the afflicted wine growers of the Sonoma Valley, the importance of using the native vine as grafting stock for the vineyards of the future. I can but emphasize that recommendation at this time, with the hope that all who can will aid in carrying out in the several sections of the State, the important experiments suggested by Mr. Wetmore.

E. W. HILGARD.

Arpad Haraszthy on the Wild Vine.

SAN FRANCISCO, March 3, 1880.

CHAS. A. WETMORE, Esq.—Dear Sir: I have read with great interest an article on the vine emanating from you, and published in the San Francisco MERCHANT on the 20th of February, with a very well executed plate illustrating the differences in growth between seedlings and cuttings, and also showing a splendid cut of the seedling of a wild vine which for so long a time hung up in my office. The matter of seedlings, and especially of seedlings of wild vines, in view of the phylloxera, is one of the greatest importance as well as interest to all interested in viticulture. And from our present knowledge, based upon the unhappy experiences of our French neighbors in their effort to exterminate or even restrict the ravages of this insect, it would seem that in view of the high cost of

remedies and preventatives, there is but one feasible, practical method left to secure ourselves against the ravages of the phylloxera, and that is by the planting of seedlings from the wild grape. It is therefore, of the utmost interest that as many experiments be made in this direction as possible throughout the State, and more especially in Sonoma valley, where the phylloxera is now carrying on its ravages, quietly and slowly, but surely. And I consider that you have accomplished a great good, and one that will last, in the successful efforts you have made to gather seeds of our wild vine for public distribution. As far as I am concerned I confess to having become an entire convert to the value of seedlings over that of cuttings in the planting of new vineyards, and especially in phylloxera infected districts. And everything tends to demonstrate that our wild vine is not injured by the phylloxera. In the valley of Sonoma, as we together had occasion to observe in numerous instances last Fall, the wild vine grows in the utmost luxuriance right alongside of the infected cultivated varieties, not only along the creeks, but also along the fences, almost entwining its branches with those of its cultivated and dying neighbors. Though this, as you mentioned in your article on the propagation of the vine, may not be positive proof against the ravages of the phylloxera, still it has a strong leaning that way. But outside of the chances of discovering a vine that may resist this terrible scourge, through propagation from the seeds of the wild vine, there is a very great likelihood of discovering new and valuable qualities for wine-making. And from the three samples of red wine you have submitted to me, made from the grapes of the wild vine, by Mr. C. Mattier, I am thoroughly convinced that this will be accomplished as soon as the seeds you have gratuitously distributed will bring forth their product. Of the three samples you submitted to me, two of them, the red and the dark brown red, have an excellent body, a good clear astringence, a very mild sub-acid and a strongly marked port taste. I think if after cultivation they retain these qualities, they will become valuable for the production of native port and sherry wines. But the gem of the three was the last—the beautiful rich violet, purple colored sample. This was one of the very prettiest clarets I have ever tasted, of its age, in any country. It had a remarkable resemblance to the new, pure red wines of the Medoc at a similar age as I remember them. Like them it had a fine free and subacid flavor, the first giving a freshness to their taste, and the latter a

lasting sensation—the body just light enough—a fine strong but agreeable astringency which always assures great keeping and good traveling qualities. The color was identical, only several tones deeper. And like the good medoc wines when new, the flavor was almost neutral. There appeared after careful tasting but one difference, and that was the faintest suspicion of a porty taste, which I believe would not exist after the vine is cultivated, and which I attribute entirely to the great proportion which the seeds occupied in the fermenting mass. I think this vine will in the future be placed side by side with the noble Zinfandel as a claret grape, and think you have done California an inestimable service in its discovery.

As to grafting upon the wild vine or its seedlings, I need not say anything further on that head. I advocated that plan in an article published in the *Overland Monthly* in 1871-1872, with the purpose of securing a greater production and still retaining the quality desired.

In conclusion let me say that I will endeavor in every manner in my power to assist you in having experiments made in this direction.

Yours very truly,
ARPAD HARASZTHY,
President State Vinicultural Society.

The Wild Vine.

We hardly need call attention to the magnificent lithograph which we present with this week's *MERCHANT* to our subscribers. The exhaustive article by Charles A. Wetmore, Esq., on the propagation of the vine, which accompanies it, is the most valuable contribution this gentleman has yet made to the literature of viticulture in the United States, and will be immensely appreciated in France, where hundreds of costly volumes have been published on the vine. It is the first extended notice or illustration of the wild vine of California that has been published in any country. The chapter on the Zinfandel, now the most popular grape in California, is entirely new. It appears that our Zinfandel is of comparatively recent wild origin. The tradition is that it was first obtained from the seed of a wild grape found in the woods of Central Europe. Mr. Wetmore has gathered at great expense a quantity of seed of the wild vine of California and placed some of it in our hands, in half and one pound packages, for distribution. On application to this office a package will be sent free by express to any address, express charges collectable on delivery. Any farmer in any part of the State who will send for a

package and distribute a few seeds among his neighbors for planting, will do himself and his section of the country a great benefit. Subscribers should preserve the plate, as it will prove of great value to persons who are cultivating vines and have no access to more pretentious works. For the convenience of those who desire to frame one, we have had a number struck off on superior paper. Copies of the latter will be sent by mail, postage paid, securely packed in a pasteboard cone, to any address, on receipt of fifty cents in postage stamps.

The Physical and Moral Influence of the Vine.

[From the Californian.]

The progress of viniculture in California invites us to consider two important questions: What are to be its effects upon industry and commerce? What are to be its influences upon our people?

We must first estimate the extent to which this industry may be profitably developed before we can speculate upon its social results. That it will be developed to a great extent, if profitable, we have no reason to doubt.

Fortunately, we do not need to question the practicability of producing grapes abundantly, and as cheaply as in any country that might become our rival for the new markets which we may desire to supply. The vine flourishes in all parts of our State. Its fruit matures to perfection throughout an extent of country from San Diego on the south to Shasta on the north, and from the Coast Range to the Sierra Nevada. The possibilities of production are almost incalculable. It has been common to estimate our viticultural area, in rough figures, as being equal to that of France, where about six million acres have been cultivated. This guess, however, is based only upon rough estimates of choice vineyard lands. If, however, the demand for the culture of the vine should be increased in this State relatively in proportion to the demand in France, where lands are pressed into this service without regard to their especial fitness for it, we could easily select thirty million acres which would produce better average crops than are produced in France. France during the decade of 1868-77 produced an average annual crop of wine amounting to *one billion five hundred million gallons*. If we had sufficient population and demands for wine, we might produce, before exhausting our soils, eight or ten billion gallons of wine annually.

It is impossible to estimate the probable

consumption of wine of the whole world in the future. Consumption is not now the measure of probable demand; it measures only present production, which is not equal to the demands of consumers. The culture of the vine is limited to certain countries, whose capacity in this direction appears to be, in the Old World, practically tested in the fullest degree. We cannot tell how much greater the consumption might become if there were a largely increased production. The average annual production of wine in Europe was estimated a few years ago as follows:

Countries.	American Wine Gallons.
France.....	1,505,000,000
Italy.....	810,650,000
Austro-Hungary.....	575,300,000
Spain.....	523,000,000
Germany.....	156,900,000
Portugal.....	130,750,000
Russia and Turkey.....	52,300,000
Greece and Cyprus.....	26,150,000
Roumania.....	15,690,000
Switzerland	10,460,000
Total.....	3,836,200,000

Only a comparatively small portion of this product is exported to countries not producing wine. Wine producers appear to develop their markets principally among their immediate neighbors. The rapidity with which the home markets increase in consuming power indicates, possibly, the rapidity with which wine supplants all other beverages, wherever it becomes abundant and cheap.

There may be several reasons for the very small ratio that the increase in exportation bears to the increase in home consumption. The expense of transportation must be considered; but this does not appear to be the controlling obstacle to exportation. Nations generally prefer some national beverage which is produced at home. Wine appears to be the most popular, where it can be obtained in sufficient quantities to satisfy popular demands. The home market, therefore, monopolizes its use in a great degree, and wherever the home demand equals the supply, there is little inducement toward educating popular tastes in foreign lands. Wine which is *ordinaire* at home, and a staple article of diet, is suffered to remain an article of luxury abroad. There is another very important obstacle to an increased exportation—the non-transportability of the greater portion of European wines. Only a few of the products of France, Spain, Portugal and Italy can be transported, through changes of

temperature and varying climates, without fortification with alcohol.

It is impossible to determine, even approximately, to what extent France might increase her foreign markets for wine, if she produced more and consumed less; but the rapidity with which cheap table wines become popular in new countries, whenever the supply is forced upon them in an abundant manner, goes to show that if there were more wine there would be more consumers. To be popular in everyday use, it must cease to be an exceptional luxury, which can happen only when enough is furnished to effectually supplant other beverages. The increased consumption of beer in America illustrates this principle. Popular things must be plentiful.

During the decade 1829-38, France produced an average wine crop annually of 890,000,000 gallons. This was increased in forty years to 1,505,000,000 gallons, or nearly doubled in quantity. The increase in home consumption was enormous—equal to 740,000,000 gallons, or at the rate of 18,500,000 gallons increase for each successive year. Exports increased from 33,000,000 gallons to 68,000,000 gallons, or at the rate of less than 1,000,000 gallons for each successive year. Meanwhile, the importations have increased from 56,800 to 40,000,000 gallons; also, the quantity distilled and converted into vinegar decreased to an extent two and a half times greater than the increase of exportations. The price of wine also increased steadily. These facts show how rapidly wine may grow in favor as a popular beverage. The demands of foreign markets have been the least to cause the vast progress of French viticulture. The home demand has really been greater than the supply, and we have, therefore, no facts to indicate to what extent foreign markets for wine might have been developed if the supply had been sufficiently abundant.

Spain can only, with few exceptions, send her natural light wines toward the north. They find a market during the winter in Paris and other parts of France. The alcoholized wines of Spain and Portugal are too spirituous ever to become popular beverages for daily use, and we cannot, therefore, deduce anything from the commerce in them to show the possible limit of the exportation of natural table wines. We observe, however, that whenever pure natural wine is plentiful it becomes popular, and the consumption generally equals the supply. We have seen the supply becoming abundant in California, and at the same time consumption has increased in a few years, so that now more wine is consumed here by a population of

less than a million than is imported into the whole United States from France. The abundant supply is the educator.

From a study of all the facts bearing on this subject, it seems probable that if California should increase her production to 1,000,000,000 gallons annually, markets would open themselves as fast as her abundance was ready to supply them. California wines have a superior commercial value. They are transportable into and through all climates, without requiring adulteration with alcohol. We can, therefore, produce the merchandise in abundance and find markets for it. This view of our vinicultural industry is flattering to our ideas of future importance and encouraging to the farmer. Our vineyards may be increased one hundred fold at least with safety, provided reasonable methods of culture be pursued, and the requisite skill in wine making acquired.

We have, however, taken no note of the vines that will be required by raisin producers. More brandy would be distilled in France, if there were wine to spare. We can always have wine to spare if we cultivate sufficiently, because we have an abundance of suitable land. The time may possibly come when syrup made from grape juice will be a popular article of diet. These things promise increase to the vineyards. Rapid transportation promises a great market among our Eastern fellow citizens for fresh grapes. Surely there is no danger of over-production. Our people will soon realize this, and the rush of the Argonauts of 1849 will be distanced by the rush to the shrine of the wine god in the near future.

The results which this agricultural development will show in our industrial and commercial life will be amazing. The gold of the Sierra did not build cities as surely as will the vines of its foothills. One million families, as proprietors of vineyards, will produce one billion gallons of wine. Another million families will obtain support in the industries and mercantile pursuits which will rest on this production. Fleets of ships will come and go, and add spirit to the busy scene. Viticulture will increase the population of the cities around the Golden Gate one million souls. Most notable will be the effect upon the country towns. The vine makes homes in the country attractive, and develops village growth. Already we see this tendency in our new State. Los Angeles, San Gabriel, Anaheim, Sonoma, St. Helena, Mission San Jose—how beautifully they grow! Village life is the secret of French prosperity. The country is all utilized and labor economized. The vine and industry intertwine wherever the people are industrious. The one nour-

ishes and supports the other, and makes life tolerable both to the peasant and to the factory hand. Our villagers will tend vines, pick and crush grapes, nurse wines; and among them there will live coopers, wagoners, kitchen gardeners, dairymen, silk spinners and the pressers of the sacred olive oil. Shepherds and herdsmen will come down from the hilltops to sleep in vineclad cottages. We know what viticulture has done elsewhere; we can predict what it will do here.

The Department of the Gironde in France affords ample proof for the assertion that "the vine is the friend of man." That department, in which the trade of Bordeaux springs to life, contains 2,520,000 acres, of which about one-half is wooded, desert or swamp. The greater portion of the arable land is covered with vines. The area of vineyards was computed in 1873 at 471,000 acres. The population in 1876 was 735,242. Of this Bordeaux had 215,000. Viticulture is its chief support. What it has done for this section of France, it can and will do for the counties of Napa and Sonoma in California. Those two counties will yet sustain as much population as the entire State does now. Vallejo may yet have a population of two hundred thousand. Edouard Féret, in his *Statistique Générale*, says: "The development of population in a great number of rural communes of our department (the Gironde) seems everywhere to coincide, or rather to be the consequence of, the progress of viticulture, which forms, without doubt, the basis of our public fortune." Equal marvels of the sustaining power of the vine are to be seen in other parts of France; but in the Bordeaux district they are less complicated with other industrial forces than elsewhere. Cetee, on the Mediterranean, has grown from 10,000 to 40,000 inhabitants during the last twenty-five years, its support being chiefly the preparation of imitation wines. The Bordeaux district (the Gironde) produces about 80,000,000 gallons of wine annually. This product will be equaled in California before many years have passed away. This growth, by its own vitalizing force, will support metropolitan life equal to that of Bordeaux. People do not like to leave their "vine and fig tree." No other homes are more charming than their own. Viticulture and viniculture establish communities and check rovers. The vineyardist not only loves his occupation, but he becomes enthusiastic in it. He is the truest patriot who loves his home life most. The vine is therefore not only "the friend of man," but it also makes him more loyal to his country. It exerts a material influence upon the State, and leads to industry. Viti-

culture will inspire men with the spirit of industry and bless them with contentment; it will check the feverish spirit of speculation and gambling.

And here we begin to think of the moral, as well as the material, influence of the vine upon our growing population. Those directly engaged in this industry, whether as farmers, wine makers, raisin dryers, brokers, coopers or merchants, will feel securely settled in permanent occupations. The vine grower will not be as unsettled in mind as the potato grower; his crops have world-wide markets, and may rest, if converted into wine vinegar, brandy or raisins, until markets are ready for them. This condition of industry must necessarily exert a powerful influence upon his character and disposition. Security will make him contented and genial. His occupation is such that he becomes satisfied with a comparatively small farm, and surrounds himself with agricultural laborers, whose lives are not dependent upon precarious harvest demands. The work about vineyards and wine cellars requires trained men; raw recruits from intelligence offices or the Indian reservations will not do for the vineyard, as they may for the dreary wheat farms. Country life, under the influence of viticulture, becomes compact; villages spring into existence and society organizes. The proprietor becomes proud of his success, and looks upon his products with the sensitive affection of the artist. Each vine growing section swears by its own wine. In France the Bordelais never tires of singing the praises of his own wine, and stoutly maintains that his is the best and that all others are trash. He is content with his lot. The Maconais with equal zeal rejoices in his warm and generous wine, and denounces the Bordelais claret as cold and rough. So, too, with *vignerons* of the Landes, of Languedoc and of the Marne. And so, too, does the Spaniard boast of his *vino del pais*. The German thinks that he only knows how to nurse wine; that the Frenchman knows how to "doctor" it. The Hungarian looks upon his wine and his country as inseparable; treason to one is treason to the other. So proud is he of his product that he enables those who obtain honor for it in foreign lands.

Not many years ago, the Chamber of Commerce of Vienna encouraged Mr. Max Greger to endeavor to make known in England Hungarian wines, which in many respects resemble those of California. He labored with zeal to do this, attacking old prejudices in London with courage and persistence, and succeeded finally in breaking down the monopoly of public favor enjoyed by the trade in port, sherry and French claret. He

began ninth on the list of large importers into England and last year stood the second. Hungarian pride was touched and gratified. This wine merchant was considered as a great patriot. He was honored with the order of the "Golden Cross of Merit with the Crown." In 1875, the Emperor of Austria conferred upon him the title of "Knight of the Imperial Order of Franz Josef." And still further, he was raised to the nobility, with rank to descend to his children. The Crown Prince of Austria, in 1878, when visiting England, found among the notable places he was instructed to visit, the cellars of Mr. Max Greger, which he inspected in a public manner most gratifying to his countrymen.

No other industry begets so much local and national pride. It inspires laudable ambition, rather than avarice. We have seen much of this industry among the pioneers in our own State. Agoston Haraszthy began to think of it, and the more he thought the more did his self-interest sink out of sight in the grand idea to be the promoter of viniculture. He traveled throughout Europe, nominally as a State Commissioner from California but in fact at his own expense, and gathered not only information but thousands of vines of many hundred varieties, which he cultivated at Sonoma, and upon the success of which has been based the many experiments which have so successfully proved the value of our new industry. Among his greatest successes was the culture of the Zinfandel, a Hungarian grape heretofore little known in viniculture, but which is destined to lift California wine cellars into successful rivalry with the boasted cellars of Bordeaux. His son, Arpad Haraszthy, was educated to pursue this work. The father realized how much there was to learn; his son caught the spirit and devoted several years to study in the Civil Polytechnic School at Paris, to apprenticeship in the champagne district, and to practical work in the vineyards and cellars of Bordeaux. Our pioneer vineyardists risked everything, and struggled for years against shy capital, creditors and a prejudiced public; very few of them lost their faith, even when oppressed by disaster and debt. The vine is a spring of hope, promising gladness. Now the battle has been won against capital, against inexperience and the mistakes of judgment and against popular prejudice. It is pleasant to know that of the pioneers in this industry fewer have failed, notwithstanding their inexperience and the hazards of experimenting, than are recorded in the history of other efforts to make this State habitable. Such vitality is the promise of grand successes in the not distant future.

Now, as to the consequences. California

is becoming a community of wine drinkers. This means a great deal. We can foresee the time when pure, natural light wines will become a part of the daily food of the majority of our people. How will this affect their social dispositions and their habits? Carefully prepared statistics show that the disposition toward alcoholic excesses, and the dyspeptic predisposition to dipsomania, are scarcely appreciable in places where pure natural wine—particularly red wine, of the claret or Burgundy types are substituted as popular beverages for other stimulants. Dyspepsia and liver troubles are scarcely known among regular wine drinkers, while they are common even among the most careful teetotalers. Where wine is produced, the people know enough to avoid alcoholic compounds, such as port and sherry, as prepared for foreign markets. Pure wine does not include port and sherry, as known to us, for they contain an addition of distilled spirits. Old fashioned English and American physicians prescribe port and sherry; a French physician knows better; he prescribes a ripened, pure, dry claret, as a tonic beverage and regulator of the digestive and assimilating organs. France manufactures great quantities of ports and sherries, but she refuses to drink them. Our people, with an abundance of pure table wine, will reject heavy beer, whisky, bar-room and club tippling, and all the abominations of compounded and alcoholized wines. A proper, well-fermented wine, used habitually as an accompaniment of meals, rapidly exhausts the common thirst for a stimulant, which is now the cause of frequent tippling. The "pint" of pure wine is grape-juice, in which its sugar has been converted into fermented, not distilled, spirit, and in which certain etherial parts become ripened into natural bouquets and aromas, which bring quiet to restless nerves and content to the mind. It contains also the natural acids of the fruit. The wine drinker, therefore, eats fruit regularly at his meals, and has no trouble with his stomach and his liver. The wine brings him health, and the world looks bright to him, because he is not "bilious." The revolutionists of France are not the wine drinkers; it is absinthe, beet-root spirits, and wretched adulterations, that give life to the restless, complaining, and brutal commune. A fruit diet, such as wine drinkers reasonably and regularly indulge in, cures dyspepsia and a bilious temper. They need little fresh fruit; they take it bottled, as some take it canned.

The habit of wine drinking at meals, besides conducting to a general healthful action of the digestive and assimilating organs of

life, and producing a cheerful temper, promotes many social reforms. After hard labor, man's nature seeks relaxation, restoration from exhaustion, and a pleasurable reward. It is useless to moralize about it, unless we recognize this want of his system. We have two antagonistic schools of moralists who treat upon the subject of intemperance. Intemperance results simply from illtimed, excessive, careless, unreasonable, or compulsory habits of dieting. What one drinks is part of his diet. There are those whose doctrine is, that man should obtain the least possible physical enjoyment from the greatest possible exertion. Others think that the greatest possible resonable and sane enjoyment should be the reward of labor. The latter do not affect to consider physical enjoyment as degrading; they do not think it beneath their dignity to discuss what they eat and drink, as critics; they rejoice in an invention which causes twenty-five cents to produce a more agreeable sensation to the palate and a greater comfort in digestion. The true cook is an inventor who endeavors, not to procure the greatest amount of enjoyment at unlimited cost, but the greatest from a given and limited expenditure. He is an eclectic; he rejects woody radishes, rank water-cress, and heavy wines, and selects young and tender escutents, and dry tonic wines, with bouquets that make the lips smack before they touch the glass.

Wine is a civilizer in the family. It makes the dinner eventful, and prolongs its period of enjoyment. It brings man and wife into full sympathy, and lets the woman into the man's most entertaining moods. He does not save his wit and smiles for the bar-room and club. It brings a sense of satisfaction, peace and comfort, and invites to repose, and not to excitement. Wine drinking families are not divorced every evening. Their enjoyments are in close communion with freedom, frankness and congeniality. Home is better than any club or bar-room, and the bachelors seek such homes to visit. *Pater familias* does not need to seek the bachelor at the club or the saloon. Moreover, his luxuries become cheap and economical in this way, and he becomes hospitable. The bottle of wine makes the table cheerful; the tired and over-anxious wife is not troubled about what she has to offer her guest. Such tables offer no apologies, and need none.

Wein, weib, gesang; these are the results. Wine is not jealous, nor timid. It unites man and wife, and they sing; their hearts sing if their voices cannot. Without wine, stimulus comes from behind doors and screens. It is secretive and ashamed of itself. Whisky, and even beer, to a great ex-

tent, divorce the family relations, destroy home society, become ill-timed and unreasonable, and lead to discord and complaint. A man leaves an ill digested and poorly enjoyed silent dinner, to wander in search of some relaxation. He ceases then to control his actions, because other houses and places are not under his control. He ceases to know what he drinks, and is imposed upon. He goes home relaxed, perhaps jolly; he forgets that his wife has not had the same relaxation, and his jolly temper is turned acid by her habitual tired expressions and coolness. Women fight the saloons partly from fear, partly from jealousy; neither habitual fear nor habitual jealousy are promoters of peace, good will and contentment. The women then begin to think of rights of all kinds, and women's rights in particular. Wine at the table would make it all right.

When we talk of "wine and women," too many think only of champagne and hilarity. This is not what we mean by wine drinking. Champagne is an exceptional luxury; but natural wines, such as sound dry Zinfandel, or Riesling, are never boisterous. They lead to no more excesses than tea or coffee, and are rarely as dangerous to the stomach. The condition of the stomach and liver rules the head. Avoid distilled spirits, regarding them as drugs, useful when intelligently prescribed; avoid alcoholized wines and heavy beers; and there will be no danger of intemperance. Let prohibitory legislation reform itself. Seek out specific dangers, and restrain them, as the sale of drugs is restricted. Punish adulterations and adulterers, and society will be very safe and happy. The vine has been called "the friend of man;" it should be called the mutual friend of man and wife. It is an anti-divorce prescription.

There has never yet been a good opportunity to observe the effect of habitual wine-drinking upon an Anglo-Saxon community. No country mainly composed of Anglo-Saxons has yet been a wine producer, to the extent of providing sufficient to supplant spirits as a beverage. We are to test the question in this State, and perhaps in the United States. The student of temperaments, however, has much to base opinions upon. The Frenchman and the Irishman, when judged on equal terms, differ mainly in their habits, which control thought and sentiment. What might not wine have done for Ireland? What might not whisky have done for France? There are wine-drinking Englishmen (not the port and sherry drinkers), Irishmen, Germans, and Americans. Observe, then, their family life, their gentleness and gentility, their affections, and their unity. American topers go to France and come back

cured—come back gentlemen. Wine makes gentlemen, as grog makes brutes. Wine makes a polite tongue; whisky makes a foul-mouthed blackguard. Wine carries with it the associations with which it is served; whisky does likewise. Man is a machine—unimpressible, unteachable, while at work his ideas flow and he receives impressions when relaxed. How can a man become a gentleman who gets his relaxation in grog?

"Grog" means all that goes with and surrounds it—all that surrounds its consumer. The vine will build up our State and enrich and comfort our people. Wine will cure dyspepsia, change a bilious temper, repair a broken hearth, relieve woman's lonesomeness, and mend our manners.

Moral: plant vines, and make a home; drink wine, and become a gentleman.

CHARLES A. WETMORE.

APPENDIX.

Since the publication of the first edition of this pamphlet, I have received numerous letters concerning the wild vine in California (*Vitis Californica*). I take pleasure now in publishing them as an addition to those of Prof. Hilgard and Mr. Arpad Harazthy.

Professor Husmann of the University of Missouri wrote me as follows:

University of the State of Missouri. }
Columbia, Mo., March 29, 1880. }

CHAS. A. WETMORE, Esq.: Dear Sir—I have just recived a copy of the San Francisco MERCHANT of February 20th, containing your interesting paper and illustration of seedlings, etc., of *Vitis Californica*.

I believe with you that such a course as you advise will ultimately lead to two results. viz: 1st, establishing a race of phylloxera-proof vines; 2d, obtaining fruit with enough of coloring matter and tannin to make good old wines.

I know, from correspondence with several of your leading grape growers, that the latter is a desideratum of primary importance. I cannot see, however, how the *Vitis Californica*, if it really produces such superior fruit, has so long been overlooked and ignored. I would have thought that it would have attracted attention at once, even before the phylloxera raid. My friend, H. W. Crabb, of Oakville, has long been experimenting with varieties of our vines here, which I had to send him, for the purpose of finding the true red wine grape.

I am very sorrow that I did not see your communication in time to embody an extract from it in my book now in press, "American Grape Growing and Wine Making," which contains already several communications from California. I have shipped a great many phylloxera-proof vines and cuttings to France, and also some to Messrs. Dresel and Gundlach & Co. in your State. I am deeply interested in this, as well as all questions relating to grape culture, but so far, knew hardly of existence of *Vitis Californica*, and did not suppose it produced any valuable fruit. I should be very much obliged to you for a small package of seeds, as also, if yet in time, of a few cuttings of some desirable varieties for grafting, to be tried in our experimental vineyard here. If you desire it I can reciprocate with some cuttings of Newton Pearl, Black Taylor and Transparent, which you will find described in our catalogue, which I send, and shall be glad to correspond with you at any time. Hoping to hear from you soon, I remain yours truly, GEO. HUSMANN.

A package of seeds was sent by me to Prof Foex, of the National School of Agriculture at Montpellier, France, at which institution are growing all the well known varieties of American vines. The Professor kindly responded as follows:

Department Agriculture and Commerce,
National School Agriculture of Montpellier
Viticultural Station.

MONTPELLIER, April 6, 1880.

DEAR SIR—Permit me to thank you for your kindness in sending me seeds of the *Vitis Californica*. I am infinitely obliged to you for having remembered my request, for we (Prof. Planchon and myself) have had a great desire to possess this variety, which has not before this been imported into Europe. Thanks to your kindness, we are going to have an opportunity to study it.

The tendency toward the plantation of American vines becomes more and more established with us, by reason of the failure of insecticides in places which have been for a long time attacked by phylloxera. The types which we prefer are, for the sake of their fruits, the Jaquez (or Ohio, Cigar-box, etc.), Herbemont (or Warren), and the Black July (or Devereux Lenoir). For grafting stock we prefer the wild *Vitis Riparia*, which is sent to us from Missouri, Iowa and Kansas, and the *Vitis Rupestris*, from Texas.

I take the liberty in addressing to you by this same mail a little pamphlet containing a resume of practical lessons in grafting American vines, which I gave a month ago at the College of Agriculture.

Accept, dear sir, my kindest regards, etc.,
G. FOEX.

CHAS. A. Wetmore, San Francisco, Cal.

The publication of a notice in the SAN FRANCISCO MERCHANT offering to distribute gratis packages of the seed brought to the editor of that paper and to myself a great number of applications. The entire collection which I had made—amounting to three hundred and twenty five pounds of seeds, have been distributed in parcels from a half pound in weight upwards. Accidentally, a complete list of the names to whom these were sent was lost, but the following names are remembered; Professor E. W. Hilgard, California State University; John L. Beard, Centerville, Alameda Co.; Chas. Kohler, Sonora; Gundlach & Co., Sonoma; Chas. Krug, St. Helena, Napa County; Hon. S. C. Hastings, Rutherford, Napa County; C. T. Hopkins, for Los Angeles County; Jas. H. Drummond, Glen

Ellen, Sonoma County; Oliver Halden, Fresno; J. A. Drinkhouse, Sacramento; H. E. Hitchcock, Oakland; M. Keller, Los Angeles; Mrs. W. B. Bourne, St. Helena; Miss Lulu Littleton, Alameda; E. H. Rifford, San Francisco; Howe & Hall, San Francisco; Mr. Hillon, Sec'y, Natoma W. M. Co., Folsom; J. R. Whitney, San Jose; J. B. Pierce, Santa Clara; Wellman, Peck & Co, San Francisco; Dr. F. Wrightson, Napa; Hon. H. M. Street, Riverside; E. Brierly, Riverside; Fred. I. Huse, San Diego; Miss Hannah Millard, Lake County.

Packages have been sent out of this State to the following: Professor Husmann, University of Missouri; Leonard Casper, Saratoga Springs, New York; Hawaiian Commercial Co., Honolulu; Professor Foex, National School of Agriculture, Montpellier, France; A. H. Trimoulet, Vice President Viticultural Union of the Entre-deux-Mers, Bordeaux; to Italy by the Italian Consul; to Spain by Mess. Hellman Bros & Co.

I have recently received letters from Wm. C. Mattier, of Harbins Springs, Lake County, who is pursuing his studies of this vine with great zeal and care. This year his seedlings will be two years old. He finds differences in bark, roots and leaves among the wild vines, as well as in the wine. I have received from him samples of wine he made for me last year—which will soon be examined by experts. It is now old enough to study.

At my suggestion he has waived his right to name these seedlings and has adopted the name I mentioned to him, which is Matilda seedling or as he uses it in his native language *la Matilde*. For convenience in referring to these seedlings, which will differ in some respects no doubt from seedlings of other wild vines of this State, I respectfully request that this name may be generally adopted by those who have used the seeds, which I have distributed. I feel assured that this promising plant will honor the memory of my mother in generations to come, after she whose beloved name it bears shall have left this world in which she has been a true vine—fruitful in all that is good and strong in her womanly power of love and kindness.

PROGRESS OF THE MATILDA SEEDLINGS.

The seeds, which have been distributed have been germinated in many parts of the State, with varying results. At Oakland, I have experimented with them for the purpose of ascertaining their germinating power. About one half of the seeds, I found to be dead, killed mostly by a small worm. These dead seeds were easily separated by floating them off in water. Counting samples of the sound seeds, I found that they averaged about four thousand to the pound. Among the wild grapes were many which were attacked by insects common to the places where they grew which are generally in creek bottoms among dense foliage of oaks and and other

trees. These insects probably produced the worms, which were found in one half the seeds. By carefully sowing small numbers of the sound seeds in boxes and pots, I found at Oakland, even during the past unfavorable spring, that about ninety per cent. germinated successfully. It is evident from what I have seen that between three and four thousand plants can be obtained from a pound of seed.

My observations, and also those of Mr. Mattier at Harbin's Springs, prove that the *Vitis Californica* is very late in bursting its buds, or germinating from the seed. Although I sowed seeds early in March, and others in April, none germinated before the 1st of May, and from that time until the first week in June they came up rapidly. It seems, probably, that experience will prove that the proper time to sow them is in April.

Most of my seeds were first soaked twenty-four hours, and this probably would be best usually for field sowing; but I have observed no especial advantage when the Spring rains were late. Shallow sowing is better than otherwise. They have succeeded very well with me when lightly covered with sandy loam. Manured soils breed insects, which trouble the young plants.

Mr. C. Mattier planted seeds in April. One of his seedlings, six months and a half from the seed, is the same that was illustrated by the MERCHANT—a little less than one-half the natural size. This year he writes me that his seedlings—one year old—were very late in coming into leaf, but they have already grown amazingly in the short time since the buds have burst. On the 4th of June some of them had new cones five feet long. The most remarkable feature of this culture of the wild vine is the vigor of the young growth. The leaves of the wild vines in their wild state are generally small; but these seedlings have, on their second year, leaves that measure four inches across by six inches in length. It is safe to presume that the fruit will correspondingly increase in size. The ateness of their growth will enable them to escape spring frosts.

Mr. Mattier is constantly pursuing these investigations. He finds by an examination of roots and wood that his opinion that there are distinct varieties of the wild vine is supported by other proofs. Roots, barks, color, etc., vary.

The samples of wine, which he made for me, and which were tasted by Mr. Haraszthy and referred to in his letter heretofore published, are now older, and will soon be carefully examined and analyzed. When that is done a further report will be made public.

Enough, however, has been learned already to demonstrate that these seedlings are endowed with superior vitality and vigor; that they grow rapidly in the open field; and that they take the graft easily. The bark is tough

and probably as useful, if not more so, as the other American wild stocks for defense against the phylloxera.

A D D E N D A.

Since the above was put in type :

I have had an opportunity to obtain scientific examination of the samples of wine of the wild grape which were fermented last Fall by Mr. C. Mattier at Harbins Springs.

Unfortunately Mr. Mattier had no facilities to ferment more than very small quantities, and in keeping them he was obliged to mix the best claret-like sample with the brownish wine.

Professor Federico Pohndorff, of this city, and Monsieur A. de Lacretele, of the French Society of Agriculturists, examined the wine together. Subsequently it was also examined by Dr. John I. Bleasdale, Secretary of the Board of State Viticultural Commissioners.

Prof. Pohndorff and Monsieur de Lacretele agreed that it was important to experiment with the seedlings of this vine, for the purpose of ascertaining its value for grafting stock.

Prof. Pohndorff was decidedly of the opinion that the wine of the wild vine would be found to be a useful addition to our wine product. He has given me the following report:

"Samples of red wine made from the wild grape (*vitis Californica*).

"Color—brownish hue, lively and tinting power; not a correct color for a red wine. The mode of making the wine not having been stated, it is difficult to guess the reason of the brownish color, but the sample grapes seen will allow me to infer that green, unripe grapes joined to the mature ones in the press have caused it in part; the coloring matter in the ripe grapes may in the sylvan state of the grape be of a composition which has not the effect of communicating a more perfect tinge of wine-red to the juice. A surplus tannin in the seeds may likewise have affected the color, turning it. The soil it grew in finally may have influenced it.

"Taste—Of a dry wine, well fermented astringent, of a fruity nondescript but vinous, liquid, very acid, but certainly not in any way acetic, hence sound; nearest fruit analogy in taste to currants.

"Aroma—Vinous, resembling the flavor of raspberries, being for the comparative want of character as a wine in its taste, rather pronounced *alcoholic*. Strength test of one tested example, 10.9 per cent.

"Acids—Free acids of one of the samples 9.7 per thousand. Fruit acids predominant. Tannin still united considerably.

"Is it probable that by cultivating the vine these wines were made of, a more perfect wine would result? Certainly.

"Will the improved wine be of the nature of light wines? No; the amount of alcohol would show a proportion of about 22 per cent of saccharine; the acids are considerable.

Thus the result of cultivation would probably be a wine of similar parts as the ordinary grape vines of the state contain, and the wine be then one between cold and hot wines. The flavor of a fruit like raspberry, with proper proportioning of acids, would indicate a form which might come near to that of an ordinary Bordeaux; but a good deal of cultivation would be required for this object.

"Would it be right to advise the propagation and cultivation of the wild grape? Undoubtedly it would be, for the reason that a sound wine, however ordinary, can be made from it—that from the standpoint of protecting nobler vines from the inroads of the phylloxera, it is useful, hence advisable—that no harm but only good can result from planting even larger tracts of land with it, as there is value rendered, for the wine, if by itself defective, can be employed anyhow, either for blending or by being blended into a well-tasting wine—that it will present an object for practically studying how to make in the press a good wine, rightly proportioned of it—that even if no wine of any quality will be rendered by the grape, it yields its rich content of alcohol, which for distilling it into Brandy or Spirit, will always pay the investment in wild vines in a plantation—and lastly that the brandy distilled from it, having, as shown by a test distillate, both the taste and flavor of fruit of grape, will form probably a good type of brandy.

F. POHNDORFF.

San Francisco, June 18, 1880.

P. S.—

"The alcoholic strength surprised me; such an amount of sugar the wild grape has, would indicate that by ennobling it through cultivation it might be brought to a level with the sweetest grapes in the state.

"Mr. de Lacretele supposed phenic acid to overrule the acids of one of the examples. An analysis of that part of the composition of the acids of the wine, which can be found by reagents, will show if this supposition is right. My test of the free acids with caustic alkali was hasty superficial one. The wine is certainly susceptible of being rightly trained and after a few years of cultivation showing us a distinct form, perfected and valuable. Soil and situation of the vineyard will influence this greatly.

June 19th.

F. POHNDORFF.

"Dr. Bleasdale has completed a partial analysis of one sample with the following result:

"*Vitis Californica*; produced at Harbins Springs, Lake county, Cal.; specific gravity of wine, 1.0840; temperature, 60° F.; specific gravity of distillate, .98495; percentage of B proof spirit, 20.003; alcohol, 11.428; tannin, per cent, 0.812; extractive matters, 0.2134.

"N. B.—Tannic acid was determined according to Wittstein's formula. J. J. B."

CHAS. A. WETMORE.
111 Leidesdorff street, San Francisco, June 9,
1880.

TO VINICULTURISTS.

THE SAN FRANCISCO MERCHANT,

A WEEKLY TRADE PAPER.

PUBLISHED EVERY FRIDAY MORNING,

DEVOTED TO THE ENCOURAGEMENT OF THE

Productions, Manufactures and Commerce of the Pacific Coast

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